Hypothesis functions

In machine learning, a hypothesis function is a mathematical function or model that maps input data to output predictions. It is the foundation of supervised learning algorithms, where the goal is to learn a function that can accurately predict the target variable based on the input features. The hypothesis function is typically expressed as a set of parameters that characterize the model's behavior.

Consider the example of predicting house prices based on factors such as square footage, number of bedrooms, and location. The hypothesis function in this case could be a linear regression model, which represents the predicted house price as a linear combination of the input features. The parameters of the model would be the coefficients of the linear equation.

Hypothesis Testing

> *Hypothesis testing is a statistical procedure used to evaluate two competing hypotheses about a population.*

In the context of machine learning, hypothesis testing is used to assess the performance of a machine learning model.

The null hypothesis (H0) typically states that there is no relationship between the input features and the target variable, while the alternative hypothesis (H1) states that there is a relationship.

To perform hypothesis testing, we first need to define a test statistic, which is a numerical measure that quantifies the evidence against the null hypothesis. The test statistic is calculated based on the observed data and the model's predictions.

In hypothesis testing, after calculating the test statistic, it is compared to a critical value determined by the significance level (α). If the test statistic exceeds the critical value, we reject the null hypothesis, concluding there is significant evidence for the alternative hypothesis. Conversely, if the test statistic is less than or equal to the critical value, we fail to reject the null hypothesis, indicating insufficient evidence to support the alternative hypothesis. The critical value serves as a threshold for decision-making in hypothesis testing.

References:

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